IN THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (Original) A method for estimating carrier frequency and phase offsets of a digitally modulated signal, comprising:

(a) estimating one or more phases of a sequence of digitally modulated symbols;

(b) removing from each of the estimated phases an angle rotation introduced by a modulation format, wherein the rotation is determined based on a reference symbol;

(c) deriving a set of values from the estimated phases after removal of said angle rotation, wherein said values are a function of the carrier frequency and phase offsets to be estimated; and

(d) processing said values to determine estimates of the carrier frequency and phase offsets.

2. (Original) The method of claim 1 further comprising:

(e) initializing the parameters of a Phase-Locked Loop with the estimated carrier frequency and the phase offsets.

3. (Original) The method of claim 1 wherein step (c) uses an unwrap phase function to derive said set of values.

4. (Original) The method of claim 1 wherein the processing of step (d) uses an estimation algorithm based on the recursive least-squares method.

5. (Original) The method of claim 1 wherein the processing of step (d) uses an estimation algorithm based on the Kalman filtering method.

6. (Original) The method of claim 1 wherein the processing of step (d) uses an estimation algorithm based on the least-mean squares method.

7. (Original) A method for recovering a carrier phase offset and a carrier frequency offset comprising the steps of:

(a) receiving a modulated signal containing a plurality of symbols;

(b) determining an angular location of first symbol;

(c) determining an angular location of a second symbol;

(d) removing the modulation from the second symbol to produce an unmodulated angular sequence; and

(e) estimating the carrier phase and frequency offsets by curve fitting the unmodulated angular sequence.

8. (Original) The method described in claim 7 further comprising the step of:

(f) unwrapping the unmodulated angular sequence to compensate for phase discontinuities.

9. (Previously Amended) The method of claim 7 wherein step (e) is based on the recursive least-squares method to perform the curve-fitting.

10. (Previously Amended) The method of claim 7 wherein step (e) is based on the Kalman filtering method to perform the curve-fitting.

11. (Previously Amended) The method of claim 7 wherein step (e) is based on the least-mean squares method to perform the curve-fitting.

12. (Original) The method of claim 7 wherein the carrier phase offset and the carrier frequency offset are used as initialization parameters in a phase-locked loop.

13. Canceled.

14. (Previously Amended) An apparatus for estimating a carrier phase offset and a carrier frequency offset, comprising:

(a) a phase calculator for estimating phases of a sequence of digitally modulated symbols;

(b) a remove modulation module for removing an angle rotation introduced by a modulation format to generate a sequence of phase values representative of the carrier frequency offset and the carrier phase offset;

(c) an estimation module for estimating the carrier frequency offset and the carrier phase offset, whereby the estimation module applies a curve-fitting algorithm to the sequence of phase values to generate a linear function dependent of the carrier frequency offset and the carrier phase offset; and

(d) an unwrap module for converting the phase estimates generated by the phase calculator module into absolute values.

15. (Previously Amended) The apparatus of claim 14, further coupled to a phase-locked loop to initialize the phase-locked loop with the estimates of the carrier frequency offset and the carrier phase offset.

16. (Previously Amended) The apparatus of claim 14, wherein the estimation module applies a curve-fitting algorithm to the sequence of phase values to estimate the carrier frequency offset and the carrier phase offset.